

Atty Docket No. 80398.P350

Patent

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)	Examiner:	L. Ye
)		
Ted J. Cooper)	Art Unit:	2612
)		
Serial No. 09/696,436)	Confirmation No:	3904
)		
Filed: October 24, 2000)		
)		
For: METHOD AND APPARATUS)		
TO PROVIDE EDGE)		
ENHANCEMENT AS PART OF)		
A DEMOSAICING PROCESS)		

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

This is an appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner of Group 2612, dated March 21, 2005, in which claims 1-20 in the above-identified application were finally rejected. This Appeal Brief is hereby submitted pursuant to 37 C.F.R. § 41.37(a).

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the full interest in the invention, Sony Electronics, Inc., 1 Sony Drive, Park Ridge, New Jersey 07656.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision in the instant appeal.

III. STATUS OF THE CLAIMS

Claims 1-20 are pending in the application and were finally rejected in an Office Action mailed March 21, 2005. Claims 1-20 are the subject of this appeal. A copy of Claims 1-20 as they stand on appeal are set forth in Appendix A.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been made after receipt of the Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's invention as claimed in claims 1-20 is directed to capturing a raw image and providing edge enhancements to increase edge detail to the capture raw image as part of a demosaicing process [Specification: Page 9, Line 17 – Page 10, Line 10; Figure 3] A brightness map of the captured raw image is used for providing the edge enhancements. [Specification: Page 10, Line 22 – Page 11, Line 20; Figure 5] Furthermore, the edge of the captured raw image is detected using the brightness map, a mask image is created from edge detected brightness map, and an unsharp edge enhancement is performed on the mask image. [Specification: Page 11, Line 21 – Page 12, Line 19; Figure 5]

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

I. Claims 1-15 stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,404,918 to Hel-or et al. in view of Kimmel (IEEE Transactions on Image Processing, Col. 8, No. 9) and U.S. Patent No. 5,717,781 to Ebel, et al.

II. Claims 16-20 stand rejected under 35 U.S.C. § 103(a) over Hel-or et al. in view of Kimmel, Ebel et al., and U.S. Patent No. 6,288,743 to Lathrop et al.

VII. ARGUMENTS

I. Claims 1-15 are Patentable under 35 U.S.C. § 103(a) over Hel-or et al in view of Kimmel and Ebel et al.

Hel-or discloses a demosaicing method for generating a full color image from a partially sampled image. During the demosaicing process, the luminance image component is directionally smoothed along image edges to preserve edge detail. Thus, Hel-or discloses preserving edge detail during the demosaicing process.

Kimmel discloses reconstructing a digital image by first demosaicing and then enhancing the resulting image. The demosaicing step reconstructs the image using an edge-weighted interpolation, so as to avoid interpolating across edges and preserving edge detail. The enhancement step enhances the edges of the reconstructed image by inverting the color diffusion across the edge.

Ebel discloses analyzing an image of a contact lens to determine quality of contact lens. A CCD sensor captures the image and an image processing system corrects the image for known defects in the CCD sensor. The system enhances the edge detail of the lens in the corrected image using an edge enhancement operator. In addition, the system partitions the image into five zones so that the proper directional edge operator is chosen. The system analyzes the lens quality based on the enhanced, corrected image.

A. Claims 1, 2, 6, 7, 11, 12

Claims 1, 2, 6, 7, 11, and 12 stand or fall together. Claim 1 is the representative claim. The invention claimed in claim 1 captures a raw image and performs edge enhancements to increase edge detail on the raw image as part of a demosaicing process.

Appellant respectfully submits that the combination of Hel-or, Kimmel and Ebel does not teach or suggest each and every element of claim 1. In claim 1, Appellant claims providing edge enhancements to increase edge detail of a captured raw image as part of a demosaicing process. The Examiner admits that Hel-or does not teach or suggest this claim limitation and relies on Kimmel and Ebel as disclosing the missing element.

However, because Kimmel discloses providing edge enhancements to the reconstructed image after the demosaicing step, Kimmel cannot be properly interpreted as disclosing increasing edge detail of the raw image as part of a demosaicing process. Furthermore, because Ebel does not disclose a demosaicing process, Ebel cannot teach or suggest an increase to edge detail of the raw image as part of a demosaicing process.

In addition, Appellant respectfully submits that it would not be obvious to combine Hel-or, Kimmel, and Ebel. “A prior art must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention.” MPEP 2141.02. Hel-or discloses preserving edge detail whereas Kimmel and Ebel disclose enhancing edge detail. Thus, Hel-or actually teaches away from Kimmel and Ebel. Therefore, it would not be obvious to combine Hel-or with Kimmel and Ebel.

Because none of Hel-or, Kimmel, or Ebel teach or suggest providing edge enhancements to increase edge detail of a captured raw image as part of a demosaicing process as claimed in claim 1, the combination cannot be properly interpreted as disclosing this claimed element. Therefore, the combination cannot render obvious Appellant’s invention as claimed in claim 1. Accordingly, Appellant respectfully requests the withdrawal of the rejection of claims 1, 2, 6, 7, 11, and 12 under 35 U.S.C. § 103(a) over the combination.

B. Claims 3, 8, 13

Claims 3, 8, and 13 stand or fall together. Claim 3 is the representative claim. Claim 3 depends on claim 1 and creates a brightness map of the capture raw image as part of the edge enhancement process of claim 1.

Appellant respectfully submits that the combination of Hel-or, Kimmel, and Ebel does not teach or suggest creating a brightness map of the captured raw image as claimed. The Examiner asserts Hel-or creates a brightness map because Hel-or separates the reconstructed image into luminance and chrominance bands. However, this process of Hel-or operates on the reconstructed image, not the captured raw image as claimed. Furthermore, neither Kimmel nor Ebel teach or suggest creating a brightness map of the captured raw image as claimed.

Because none of Hel-or, Kimmel, or Ebel, teach or suggest this claimed limitation, the combination cannot be properly interpreted as rendering obvious Appellant's claim 3. Accordingly, Appellant respectfully requests the withdrawal of the rejection of claims 3, 8, 13 under 35 U.S.C. § 103(a) over the combination.

C. Claims 4, 5, 9, 10, 14, 15

Claims 4, 5, 9, 10, 14 and 15 stand or fall together. Claim 4 is the representative claim. Claim 4 depends from claim 3. Claim 4 further defines the edge enhancement process by detecting the edges of the captured raw image, creating a mask image from the edge detected brightness map, and performing unsharp edge enhancements on the masked image.

In claim 4, Appellant claims creating a mask image from the edge detected brightness map. The Examiner asserts that Ebel discloses this claimed element by creating a mask image through partitioning the image into five zones. However, the disclosure of Ebel cited by the Examiner discloses partitioning the image so that proper directional edge operator is applied, and does not create a mask image as claimed. In addition, there is no other disclosure in Ebel that teaches or suggests creating a mask image as claimed. Furthermore, neither Hel-or nor Kimmel teach or suggest creating a mask image from the edge detected brightness map.

Because none of Hel-or, Kimmel, or Ebel, teach or suggest this claimed limitation, the combination cannot be properly interpreted as rendering obvious Appellant's claim 4. Accordingly, Appellant respectfully requests the withdrawal of the rejection of claims 4, 5, 9, 10, 14 and 15 under 35 U.S.C. § 103(a) over the combination.

II. Claims 1-15 are Patentable under 35 U.S.C. § 103(a) over Hel-or et al in view of Kimmel, Ebel et al., and Lathrop et al.

Lathrop discloses an electronic still camera that processes raw captured images into finished files. The raw captured image is initially processed by a demosaicing step to generate a full color image (referred to in Lathrop as a color filter array interpolation). The image is subsequently subjected to edge enhancements before being stored in the camera's nonvolatile memory.

A. Claims 16-20

Claims 16-20 stand or fall together. Claim 16 is the representative claim. Claim 16 claims providing edge enhancements to increase edge detail of the captured raw image as part of a demosaicing process.

Appellant respectfully submits that the combination of Hel-or, Kimmel, Ebel, and Lathrop does not teach or suggest each and every limitation of Appellant's invention as claimed in claim 16. Lathrop applies edge enhancements to a full color image and not the raw image as claimed. Thus, Lathrop cannot be properly interpreted as disclosing providing edge enhancements to increase edge detail of the captured raw image as part of a demosaicing process as claimed. Therefore, none of Hel-or, Kimmel, Ebel, or Lathrop teach or suggest this element as claimed.

Because the combination cannot be interpreted as disclosing the claimed element, the combination cannot render obvious Appellant's invention as claimed in claim 16. Accordingly, Appellant respectfully requests the withdrawal of the rejection of claims 16-20 under 35 U.S.C. § 103(a) over the combination.

VIII. CONCLUSION

The combination of Hel-or, Kimmel, and Ebel does not teach each and every limitation of Appellant's invention as claimed in claim 1-15. In addition, the combination of Hel-or, Kimmel, Ebel, and Lathrop does not teach each and every limitation of Appellant's invention as claimed in claims 16-20. Accordingly, Appellant respectfully requests the Board reverse the rejections of Claims 1-20 under 35 U.S.C. § § 103(a) and direct the Examiner to enter a Notice of Allowance for Claims 1-20.

Fee for Filing a Brief in Support of Appeal

Enclosed is a check in the amount of \$500.00 to cover the fee for filing a brief in support of an appeal as required under 37 C.F.R. §§ 1.17(c) and 41.37(a).

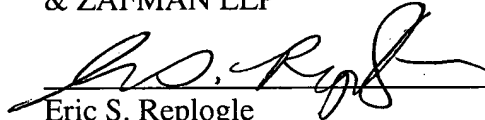
Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due. Furthermore, if an extension is required, then Appellant hereby requests such extension.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR
& ZAFMAN LLP

Dated: 8/22, 2005


Eric S. Replogle
Agent for Appellant
Registration No. 52,161

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300 x309



Atty Docket No. 080398.P350

Patent

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
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In re Application of:) Examiner: L. Ye
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Application No. 09/696,436) Confirmation No: 3904
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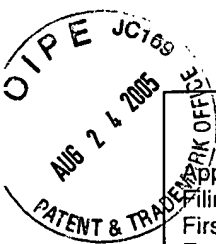
**APPENDIX A FOR
APPELLANT'S BRIEF UNDER 37 C.F.R. 41.37(a)**

1. (Previously Presented) An image processing method comprising:
capturing a raw image; and
providing edge enhancements to increase edge detail of the captured raw image as
part of a demosaicing process.
2. (Previously Presented) The method of claim 1, further comprising:
performing post demosaicing processing on the captured raw image; and
outputting the processed image.

3. (Previously Presented) The method of claim 1, wherein providing the edge enhancements includes:
creating a brightness map of the captured raw image.
4. (Previously Presented) The method of claim 3, wherein providing the edge enhancements further includes:
detecting edges of the captured raw image using the brightness map;
creating a mask image from the edge detected brightness map; and
performing unsharp edge enhancement from the masked image.
5. (Original) The method of claim 4, wherein providing the edge enhancements further includes:
blending multiplicatively the unsharp edge enhanced image with the brightness map.
6. (Previously Presented) An apparatus comprising:
an image capturing device to capture a raw image; and
a processor to provide edge enhancements to increase edge detail of the captured raw image as part of a demosaicing process.
7. (Previously Presented) The apparatus of claim 6, wherein the processor is to perform post demosaicing processing on the captured raw image and to output the processed image.
8. (Previously Presented) The apparatus of claim 6, wherein the processor is to create a brightness map of the captured raw image.
9. (Previously Presented) The apparatus of claim 8, wherein the processor is to detect edges of the captured raw image using the brightness map, to create a mask image from the edge detected brightness map, and to perform unsharp edge enhancement from the masked image.

10. (Original) The apparatus of claim 9, wherein the processor is to blend multiplicatively the unsharp edge enhanced image with the brightness map.
11. (Previously Presented) A machine-readable medium that provides instructions, which if executed by a processor, cause the processor to perform the operations comprising:
- capturing a raw image; and
 - providing edge enhancements to increase edge detail of the captured raw image as part of a demosaicing process.
12. (Previously Presented) The machine-readable medium of claim 11, further providing instructions, which if executed by the processor, cause the processor to perform the operations comprising:
- performing post demosaicing processing on the captured raw image; and
 - outputting the processed image.
13. (Previously Presented) The machine-readable medium of claim 11, further providing instructions, which if executed by the processor, cause the processor to perform the operations comprising:
- creating a brightness map of the captured raw image.
14. (Previously Presented) The machine-readable medium of claim 13, further providing instructions, which if executed by the processor, cause the processor to perform the operations comprising:
- detecting edges of the captured raw image using the brightness map;
 - creating a mask image from the edge detected brightness map; and
 - performing unsharp edge enhancement from the masked image.

15. (Original) The machine-readable medium of claim 14, further providing instructions, which if executed by the processor, cause the processor to perform the operations comprising:
- blending multiplicatively the unsharp edge enhanced image with the brightness map.
16. (Previously Presented) An image processing device comprising:
- an image capturing unit to capture a raw image;
 - a memory device to store the captured raw image;
 - an output unit coupled to the memory device; and
- a processor to provide edge enhancements to increase edge detail of the captured raw image in the memory device as part of a demosaicing process and to cause the enhanced image to be output is to the output unit.
17. (Original) The image processing device of claim 16, wherein the image capturing unit includes a charge-couple device (CCD) array, phototransistors, or photodiodes.
18. (Original) The image processing device of claim 16, wherein the output unit is a display device.
19. (Previously Presented) The image processing device of claim 18, wherein the processor is to perform post demosaicing processing on the captured raw image and to cause the image to be output to the display device.
20. (Original) The image processing device of claim 19, wherein the post demosaicing processing is a white balancing processing or a chromatic improvement processing.

**TRANSMITTAL****PATENT**

Application No.: 09/696,436
Filing Date: October 24, 2000
First Named Inventor: Ted J. Cooper
Examiner's Name: L. Ye
Art Unit: 2612
Attorney Docket No.: 080398.P350

- ☐ An Amendment After Final Action (37 CFR 1.116) is attached and applicant(s) request expedited action.
- ☒ Charge any fee not covered by any check submitted to Deposit Account No. 02-2666.
- ☒ Applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 CFR 1.16 and 1.17, for any concurrent or future reply to Deposit Account No. 02-2666.
- ☐ Applicant(s) claim small entity status (37 CFR 1.27).

ATTACHMENTS

- ☐ Preliminary Amendment
- ☐ Amendment/Response with respect to Office Action
- ☐ Amendment/Response After Final Action (37 CFR 1.116) (reminder: consider filing a Notice of Appeal)
- ☐ Notice of Appeal
- ☐ RCE (Request for Continued Examination)
- ☐ Supplemental Declaration
- ☐ Terminal Disclaimer (reminder: if executed by an attorney, the attorney must be properly of record)
- ☐ Information Disclosure Statement (IDS)
- ☐ Copies of IDS citations
- ☐ Petition for Extension of Time
- ☒ Fee Transmittal Document (that includes a fee calculation based on the type and number of claims)
- ☐ Cross-Reference to Related Application(s)
- ☐ Certified Copy of Priority Document
- ☒ Other: Appeal Brief Under 37 C.F. R. § 41.37
- ☒ Other: Appendix A For Appeal Brief Under 37 C.F. R. § 41.37
- ☒ Check(s)
- ☒ Postcard (Return Receipt)

SUBMITTED BY:

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

TYPED OR PRINTED NAME: Eric S. Replogle

SIGNATURE: 

REG. NO.: 52,161

DATE: 8/22/05

ADDRESS: 12400 Wilshire Boulevard, Seventh Floor

Los Angeles, California 90025

TELEPHONE NO.: (408) 720-8300

CERTIFICATE OF MAILING BY FIRST CLASS MAIL (if applicable)

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Date of Deposit

Carla Anyisia Nascimento

Name of Person Mailing Correspondence

8.22.05

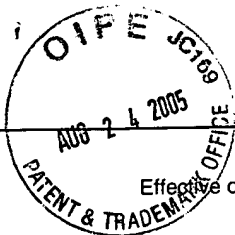
Signature 

Date

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(10/14/03)

JW
AF
\$**FEE TRANSMITTAL FOR FY 2005**

Effective on 12/08/2004. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

TOTAL AMOUNT OF PAYMENT (\$) 500.00**Complete if Known:**

Application No. 09/696,436
Filing Date October 24, 2000
First Named Inventor Ted J. Cooper
Examiner Name L. Ye
Art Unit 2612
Attorney Docket No. 080398.P350

Applicant claims small entity status. See 37 CFR 1.27.

METHOD OF PAYMENT (check all that apply)☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify)**Deposit Account**Deposit Account Number : 02-2666

Deposit Account Name: _____

☒ The Director is Authorized to do the following with respect to the above-identified Deposit Account:☐ Charge fee(s) indicated below.☒ Charge any additional fee(s) or underpayment of fee(s) during the pendency of this application.☐ Charge fee(s) indicated below except for the filing fee☒ Credit any overpayments.☒ Any concurrent or future reply that requires a petition for extension of time should be treated as incorporating an appropriate petition for extension of time and all required fees should be charged.

Warning: Information on this form may become public. Credit card information should not be included on this form.
Provide credit card information and authorization on PTO-2038.

FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

<u>Large Entity</u>		<u>Small Entity</u>		<u>Fee Description</u>		<u>Fees Paid (\$)</u>
<u>Code</u>	<u>Fee (\$)</u>	<u>Code</u>	<u>Fee (\$)</u>			
1011	300	2011	150	Utility application filing fee		
1111	500	2111	250	Utility search fee	1,000/500	
1311	200	2311	100	Utility examination fee		
1012	200	2012	100	Design application filing fee		
1112	100	2112	50	Design search fee	430/215	
1312	130	2312	65	Design examination fee		
1013	200	2013	100	Plant filing fee		
1113	300	2113	150	Plant search fee	660/330	
1313	160	2313	80	Plant examination fee		
1004	300	2004	150	Reissue filing fee		
1114	500	2114	250	Reissue search fee	1,400/700	
1314	600	2314	300	Reissue examination fee		
1005	200	2005	100	Provisional application filing fee		
SUBTOTAL (1)						<u>\$ 0.00</u>

2. EXCESS CLAIM FEES

	<u>Extra Claims</u>	<u>Fee from below</u>	<u>Fees Paid (\$)</u>
Total Claims _____ - 20 or HP = _____		X \$50.00 = _____	
HP = highest number of total claims paid for, if greater than 20			
Independent Claims _____ - 3 or HP = _____		X \$200.00 = _____	
HP = highest number of independent claims paid for, if greater than 3			
Multiple Dependent Claims _____		_____ = _____	

<u>Large Entity</u>		<u>Small Entity</u>		
Code	Fee (\$)	Code	Fee (\$)	<u>Fee Description</u>
1202	50	2202	25	Each claim over 20
1201	200	2201	100	Each independent claim over 3
1203	360	2203	180	Multiple dependent claims, if not paid
1204	200	2204	100	Reissue: each claim over 20 and more than in the original patent
1205	50	2205	25	Reissue: each independent claim more than in the original patent

SUBTOTAL (2) \$ _____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

<u>Total Sheets</u>	<u>Extra Sheets</u>	<u>Number of each add'l 50 or fraction thereof</u>	<u>Fee from below</u>	<u>Fees paid (\$)</u>
_____ - 100 = _____	_____ / 50 = _____	(round up to whole number)	X \$250.00	_____

<u>Large Entity</u>		<u>Small Entity</u>		
Code	Fee (\$)	Code	Fee (\$)	<u>Fee Description: Application size fee for each additional group of 50 sheets beyond initial 100 sheets (count spec & drawings except sequences & program listings):</u>
1081	250	2081	125	Utility
1082	250	2082	125	Design
1083	250	2083	125	Plant
1084	250	2084	125	Reissue

SUBTOTAL (3) \$ 0.00

FEE CALCULATION (continued)**4. OTHER FEE(S)**

				Fees Paid (\$)	
Non-English Specification, \$130 fee (no small entity discount)					
Large Entity		Small Entity			
Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1813	8,800	1813	8,800	Request for inter parties reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	
1253	1,020	2253	510	Extension for reply within third month	
1254	1,590	2254	795	Extension for reply within fourth month	
1255	2,160	2255	1,080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Filing a brief in support of an appeal	\$500.00
1403	1,000	2403	500	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	500	2452	250	Petition to revive - unavoidable	
1453	1,500	2453	750	Petition to revive - unintentional	
1501	1,400	2501	700	Utility issue fee (or reissue)	
1502	800	2502	400	Design issue fee	
1503	1100	2503	550	Plant issue fee	
1462	400	1462	400	Petitions to the Commissioner (CFR 1.17(f) Group I)	
1463	200	1463	200	Petitions to the Commissioner (CFR 1.17(g) Group II)	
1464	130	1464	130	Petitions to the Commissioner (CFR 1.17(h) Group III)	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	For filing a submission after final rejection (see 37 CFR 1.129(a))	
1814	130	2814	65	Statutory Disclaimer	
1810	790	2810	395	For each additional invention to be examined (see 37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
1504	300	1504	300	Publication fee for early, voluntary, or normal pub.	
1505	300	1505	300	Publication fee for republication	
1803	130	1803	130	Request for voluntary publication or republication	
1808	130	1808	130	Processing fee under 37 CFR 1.17(i) (except provisionals)	
1454	1,370	1454	1,370	Acceptance of unintentionally delayed claim for priority	
Other fee (specify) _____					
Other fee (specify) _____					
				SUBTOTAL (4)	\$ 500.00

*Reduced by Basic Filing Fee Paid

SUBMITTED BY:Typed or Printed Name: Eric S. ReplogleSignature: Date: 8/22/05Reg. Number: 52,161Telephone Number: 408-720-8300

Send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450